

SEQUENCE LISTING

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<120> NPC1L1 (NPC3) AND METHODS OF USE THEREOF

<130> JB01603-K3-US

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<141> 2003-12-16

<150> 60/397,442

<151> 2002-07-19

<150> 10/621,758

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<151> 2003-09-16

<160> 51

<170> PatentIn version 3.1

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Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu	
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Thr Ser Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg His	
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Tyr Asn Gly Pro Asn Thr Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu	
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Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Gln Val Arg	
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Tyr	Val	Ala	Ile	Ala	Ala	Ser	Ser	Trp	Val	Asp	Asp	Phe	Ile	Asp	Trp		
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Lys	Asp	Glu	Phe	Cys	Pro	Ser	Thr	Asp	Thr	Ser	Phe	Asn	Cys	Leu	Lys		
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Asn	Cys	Met	Asn	Arg	Thr	Leu	Gly	Pro	Val	Arg	Pro	Thr	Ala	Glu	Gln		
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Phe	His	Lys	Tyr	Leu	Pro	Trp	Phe	Leu	Asn	Asp	Pro	Pro	Asn	Ile			
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Arg	Cys	Pro	Lys	Gly	Gly	Leu	Ala	Ala	Tyr	Arg	Thr	Ser	Val	Asn			
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Leu	Ser	Ser	Asp	Gly	Gln	Val	Ile	Ala	Ser	Gln	Phe	Met	Ala	Tyr			
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His	Lys	Pro	Leu	Arg	Asn	Ser	Gln	Asp	Phe	Thr	Glu	Ala	Leu	Arg			
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Ala	Ser	Arg	Leu	Leu	Ala	Ala	Asn	Ile	Thr	Ala	Asp	Leu	Arg	Lys			
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Val	Pro	Gly	Thr	Asp	Pro	Asn	Phe	Glu	Val	Phe	Pro	Tyr	Thr	Ile			
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Ser	Asn	Val	Phe	Tyr	Gln	Gln	Tyr	Leu	Thr	Val	Leu	Pro	Glu	Gly			
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Ile	Phe	Thr	Leu	Ala	Leu	Cys	Phe	Val	Pro	Thr	Phe	Val	Val	Cys			
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Ser Tyr Leu Gly Pro Asp Val	Asn Gln Ala Leu Val	Gln Glu Glu	
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Lys Leu Ala Ser Glu Ala Ala	Val Ala Pro Glu Pro	Ser Cys Pro	
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Val Thr Gly Glu His Leu Ala Leu Leu Gln Arg Ile Cys Pro Arg Leu  
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Tyr Asn Gly Pro Asn Thr Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu  
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Leu Ser Leu Glu Ser Ser Met Ser Ile Thr Lys Ala Leu Leu Thr Arg  
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Cys Pro Ala Cys Ser Asp Asn Phe Val Ser Leu His Cys His Asn Thr  
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Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Glu  
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Arg Gly Ala Gly Glu Pro Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
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Pro Gly Gln Ala Leu Pro Asp Gly Ile Gln Pro Leu Asn Gly Lys Ile  
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Ala Pro Cys Asn Glu Ser Gln Gly Asp Asp Ser Ala Val Cys Ser Cys  
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Glu Ala Pro Lys Leu Pro His Lys His Lys Leu Ser Pro His Thr Ile  
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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Tyr Asn Thr  
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Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe  
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Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile  
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Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu

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Val Pro Gly Thr Asp Pro Asn Phe Glu Val Phe Pro Tyr Thr Ile  
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Ser Asn Val Phe Tyr Gln Gln Tyr Leu Thr Val Leu Pro Glu Gly  
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 Arg Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr  
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tgc gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc	144
Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser	
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ctc atg aca ctc tcc aac gtg tcc tgc ctg tcc aac acg ccg gcc cgc	192
Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg	
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Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg	
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Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu	
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Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg	
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Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr	
115 120 125	
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Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln	
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Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr	
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Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg	
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Val Pro Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr	
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp	
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Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu	
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Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu	
260 265 270	

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Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile	
275 280 285	
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Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly	
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Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys	
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Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu	
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Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro	
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Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His	
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Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn	
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Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln	
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Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn	
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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr	
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Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn	
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Asn Arg Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln	
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Pro	Leu	Thr	Phe	Lys	Asp	Gly	Thr	Ala	Leu	Ala	Leu	Ser	Cys	Met	Ala		
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Asn	Asn	Tyr	Pro	Ala	Gly	Asp	Pro	Arg	Leu	Ala	Gln	Ala	Lys	Leu	Trp		
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Glu	Glu	Ala	Phe	Leu	Glu	Glu	Met	Arg	Ala	Phe	Gln	Arg	Arg	Met	Ala		
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Tyr	Gln	Arg	Leu	Pro	Arg	Arg	Pro	Gly	Glu	Pro	Arg	Glu	Val	His	Ile		
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ggg	cga	gcc	cta	ggc	agg	gtg	gct	ccc	agc	atg	ctg	ttg	tgc	agc	ctc	2256	
Gly	Arg	Ala	Leu	Gly	Arg	Val	Ala	Pro	Ser	Met	Leu	Leu	Cys	Ser	Leu		
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Ser	Glu	Ala	Ile	Cys	Phe	Phe	Leu	Gly	Ala	Leu	Thr	Pro	Met	Pro	Ala		



755				760				765									
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Val	Arg	Thr	Phe	Ala	Leu	Thr	Ser	Gly	Leu	Ala	Val	Ile	Leu	Asp	Phe		
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785				790				795				800					
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Asp	Lys	Phe	Cys	Pro	Ser	Thr	Val	Asn	Ser	Leu	Asn	Cys	Leu	Lys	Asn		
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tgc	atg	agc	atc	acg	atg	ggc	tct	gtg	agg	ccc	tcg	gtg	gag	cag	ttc	3024	
Cys	Met	Ser	Ile	Thr	Met	Gly	Ser	Val	Arg	Pro	Ser	Val	Glu	Gln	Phe		
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His Lys Tyr Leu Pro Trp Phe	Leu Asn Asp Arg Pro Asn Ile Lys	
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Cys Pro Lys Gly Gly Leu Ala	Ala Tyr Ser Thr Ser Val Asn Leu	
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Thr Ser Asp Gly Gln Val Leu	Ala Ser Arg Phe Met Ala Tyr His	
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Lys Pro Leu Lys Asn Ser Gln	Asp Tyr Thr Glu Ala Leu Arg Ala	
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Pro Gly Thr Asp Pro Ala Phe	Glu Val Phe Pro Tyr Thr Ile Thr	
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Trp Asp Ile Ser Tyr Asn Ala	Val Ser Leu Ile Asn Leu Val Ser	
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Thr Asn Leu Pro Gly Ile Leu	Val Leu Gly Leu Ala Lys Ala Gln	
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35 40 45

Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg
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Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg
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Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu  
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Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
 100 105 110

Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr  
 115 120 125

Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln  
 130 135 140

Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
 145 150 155 160

Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg  
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Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr  
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp  
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Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu  
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Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val  
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Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys  
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Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu  
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Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile  
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Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly  
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Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys  
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Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu

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 660 665 670

Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser  
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Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe  
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Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile  
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Thr Ser Asp Gly Gln Val Leu Ala Ser Arg Phe Met Ala Tyr His  
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Val	Leu	Leu	Leu	Phe	Leu	Val	Leu	Phe	Gly	Ala	Asn	Leu	Tyr	Leu	Met		
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Glu	Ala	Gly	Met	Asn	Ala	Ile	Cys	Ser	Ser	Ala	Gly	Cys	Glu	Ser	Phe		
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Tyr	Val	Ala	Ile	Ala	Ala	Ser	Ser	Trp	Val	Asp	Asp	Phe	Ile	Asp	Trp		
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Lys	Asp	Glu	Phe	Cys	Pro	Ser	Thr	Asp	Thr	Ser	Phe	Asn	Cys	Leu	Lys		
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Phe	His	Lys	Tyr	Leu	Pro	Trp	Phe	Leu	Asn	Asp	Thr	Pro	Asn	Ile			
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Ser Asn	Val Phe	Tyr Gln	Gln	Tyr Leu	Thr Val	Leu	Pro Glu	Gly	
1100			1105			1110			
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Ile Phe	Thr Leu	Ala Leu	Cys	Phe Val	Pro Thr	Phe	Val Val	Cys	
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Tyr Leu	Leu Leu	Gly Leu	Asp	Ile Arg	Ser Gly	Ile	Leu Asn	Leu	
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ctc tcc	atc att	atg atc	ctc	gtg gac	acc atc	ggc	ctc atg	gct	3474
Leu Ser	Ile Ile	Met Ile	Leu	Val Asp	Thr Ile	Gly	Leu Met	Ala	
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gtg tgg	ggt atc	agc tac	aat	gct gtg	tcc ctc	atc	aac ctt	gtc	3519
Val Trp	Gly Ile	Ser Tyr	Asn	Ala Val	Ser Leu	Ile	Asn Leu	Val	
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Thr Ala	Val Gly	Met Ser	Val	Glu Phe	Val Ser	His	Ile Thr	Arg	
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Ser Phe	Ala Val	Ser Thr	Lys	Pro Thr	Arg Leu	Glu	Arg Ala	Lys	
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Asp Ala	Thr Ile	Phe Met	Gly	Ser Ala	Val Phe	Ala	Gly Val	Ala	
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Met Thr	Asn Phe	Pro Gly	Ile	Leu Ile	Leu Gly	Phe	Ala Gln	Ala	
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cag ctt	atc cag	att ttc	ttc	ttc cgc	ctc aac	ctc	ctg atc	acc	3744
Gln Leu	Ile Gln	Ile Phe	Phe	Phe Arg	Leu Asn	Leu	Leu Ile	Thr	
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Leu Leu	Gly Leu	Leu His	Gly	Leu Val	Phe Leu	Pro	Val Val	Leu	
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Ser Tyr	Leu Gly	Pro Asp	Val	Asn Gln	Ala Leu	Val	Leu Glu	Glu	
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aaa cta	gcc act	gag gca	gcc	atg gtc	tca gag	cct	tct tgc	cca	3879
Lys Leu	Ala Thr	Glu Ala	Ala	Met Val	Ser Glu	Pro	Ser Cys	Pro	
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Gln Tyr	Pro Phe	Pro Ala	Asp	Ala Asn	Thr Ser	Asp	Tyr Val	Asn	
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Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu  
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Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His  
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Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu  
65 70 75 80

Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu  
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Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
100 105 110

Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr  
115 120 125

Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln  
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Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
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Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg  
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 Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr  
 180 185 190  
 Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp  
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 Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu  
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 Pro Gly Gln Ala Leu Ala Asp Gly Met Lys Pro Leu Asp Gly Lys Ile  
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 Thr Pro Cys Asn Glu Ser Gln Gly Glu Asp Ser Ala Ala Cys Ser Cys  
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 Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Lys Asn

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Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe  
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Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu  
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Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile  
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Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu  
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Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Ser Met Pro Ala  
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Cys Asn Ile Ser Val Gly Leu Asp Gln Asp Leu Ala Leu Pro Lys Asp  
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Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val  
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Ser Leu Thr Gln Lys Ile Gln Tyr Ala Ser Glu Phe Pro Asn Gln Ser  
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Tyr Val Ala Ile Ala Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp  
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Leu Thr Pro Ser Ser Ser Cys Cys Arg Ile Tyr Thr Arg Gly Pro His  
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Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys  
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Val Pro Gly Thr Asp Pro Asn Phe Glu Val Phe Pro Tyr Thr Ile  
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Asp Ala Thr Ile Phe Met Gly Ser Ala Val Phe Ala Gly Val Ala  
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Met Thr Asn Phe Pro Gly Ile Leu Ile Leu Gly Phe Ala Gln Ala  
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Gln Leu Ile Gln Ile Phe Phe Phe Arg Leu Asn Leu Leu Ile Thr  
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Leu Leu Gly Leu Leu His Gly Leu Val Phe Leu Pro Val Val Leu  
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Ala Glu Ala Gly Leu Arg Gly Trp Leu Leu Trp Ala Leu Leu Leu Arg  
5 10 15

ttg gcc cag agt gag cct tac aca acc atc cac cag cct ggc tac tgc 155  
Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr Cys  
20 25 30

gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc ctc 203  
Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser Leu  
35 40 45

atg aca ctc tcc aac gtg tcc tgc ctg tcc aac acg ccg gcc cgc aag 251

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Ile	Thr	Gly	Asp	His	Leu	Ile	Leu	Leu	Gln	Lys	Ile	Cys	Pro	Arg	Leu	
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Tyr	Thr	Gly	Pro	Asn	Thr	Gln	Ala	Cys	Cys	Ser	Ala	Lys	Gln	Leu	Val	
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tca	ctg	gaa	gcg	agt	ctg	tcg	atc	acc	aag	gcc	ctc	ctc	acc	cgc	tgc	395
Ser	Leu	Glu	Ala	Ser	Leu	Ser	Ile	Thr	Lys	Ala	Leu	Leu	Thr	Arg	Cys	
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cca	gcc	tgc	tct	gac	aat	ttt	gtg	aac	ctg	cac	tgc	cac	aac	acg	tgc	443
Pro	Ala	Cys	Ser	Asp	Asn	Phe	Val	Asn	Leu	His	Cys	His	Asn	Thr	Cys	
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His	Ser	Phe	Ala	Glu	Gln	Ser	Tyr	Asp	Ser	Cys	Ser	Arg	Val	Arg	Val	
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cct	gca	gct	gcc	acg	ctg	gct	gtg	ggc	acc	atg	tgt	ggc	gtg	tat	ggc	635
Pro	Ala	Ala	Ala	Thr	Leu	Ala	Val	Gly	Thr	Met	Cys	Gly	Val	Tyr	Gly	
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tct	gcc	ctt	tgc	aat	gcc	cag	cgc	tgg	ctc	aac	ttc	cag	gga	gac	aca	683
Ser	Ala	Leu	Cys	Asn	Ala	Gln	Arg	Trp	Leu	Asn	Phe	Gln	Gly	Asp	Thr	
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Gly	Asn	Gly	Leu	Ala	Pro	Leu	Asp	Ile	Thr	Phe	His	Leu	Leu	Glu	Pro	
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Arg	Cys	Asn	Glu	Ser	Gln	Gly	Asp	Asp	Val	Ala	Thr	Cys	Ser	Cys	Gln	
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gac	tgt	gct	gca	tcc	tgt	cct	gcc	ata	gcc	cgc	ccc	cag	gcc	ctc	gac	875
Asp	Cys	Ala	Ala	Ser	Cys	Pro	Ala	Ile	Ala	Arg	Pro	Gln	Ala	Leu	Asp	
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tcc	acc	ttc	tac	ctg	ggc	cag	atg	ccg	ggc	agt	ctg	gtc	ctc	atc	atc	923
Ser	Thr	Phe	Tyr	Leu	Gly	Gln	Met	Pro	Gly	Ser	Leu	Val	Leu	Ile	Ile	
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Ile	Leu	Cys	Ser	Val	Phe	Ala	Val	Val	Thr	Ile	Leu	Leu	Val	Gly	Phe	

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	325 330 335			
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	355 360 365			
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	370 375 380 385			
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	390 395 400			
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	405 410 415			
tcc agc tac agg tat gac tct ctg ctg ctg ggg ccc aag aac ttc agc	Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe Ser	1355		
	420 425 430			
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	435 440 445			
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	450 455 460 465			
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	470 475 480			
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	485 490 495			
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	515 520 525			
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tct Ser 1205	gtg Val	gag Glu	ttt Phe	gtg Val	tcc Ser 1210	cac His	att Ile	acc Thr	cgc Arg	tcc Ser 1215	ttt Phe	gcc Ala	atc Ile	agc Ser	3713
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His Gly Leu Val Phe Leu Pro Val Ile Leu Ser Tyr Val Gly Pro					
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Asp Val Asn Pro Ala Leu Ala Leu Glu Gln Lys Arg Ala Glu Glu					
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Arg Val Ser Thr Ala Asp Asn Ile Tyr Val Asn His Ser Phe Glu					
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<212> PRT

<213> Homo sapiens

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Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser  
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Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg  
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Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu  
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Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
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Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr  
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Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln  
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Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg  
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Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr  
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Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile  
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Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly  
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Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln  
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Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser

675	680	685
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Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile 725 730 735		
Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu 740 745 750		
Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala 755 760 765		
Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe 770 775 780		
Leu Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys 785 790 795 800		
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Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe 820 825 830		
Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val 835 840 845		
Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met 850 855 860		
Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp 865 870 875 880		
Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val 885 890 895		
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Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn  
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Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe  
 995 1000 1005

His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys  
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Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu  
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Leu Leu Asp Ser Ala Ser Arg Phe Met Ala Tyr His Lys Pro Leu  
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ytnytngtng gnttymngt ngcncngcn mgngayaarw snaaratggt ngayccnaar	960
aarggnacnw snytnwsnga yaarytnwsn ttywsnacnc ayacnytnyt nggncartty	1020
ttycarggnt ggggnacntg ggtngcnwsn tggccnytna cnathytngt nytnwsngtn	1080

athccngtng	tngcnytn	ngcnggnytn	gtnttyacng	arytnacnac	ngayccngtn	1140
garytnntggw	sngcncnaa	ywsncargcn	mgnwsngara	argcnttyca	ygaycarcay	1200
tttyggncnt	tyttymgnac	naaycargtn	athytnacng	cncnaaymg	nwsnwsntay	1260
mgntaygayw	snytnytnyt	nggncnaar	aayttywsng	gnathytnga	yytngayytn	1320
ytnytngary	tnytngaryt	ncargarmgn	ytnmgncayy	tncargtntg	gwsncngar	1380
gcncarmgna	ayathwsnyt	ncargayath	tgytaygcnc	cnytnaaycc	ngayaayacn	1440
wsnytnntayg	aytgytgyat	haaywsnytn	ytncartayt	tycaraayaa	ymgnacnytn	1500
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caytttytnt	aytgygcnaa	ygncncnytn	acnttyaarg	ayggnacngc	nytnngcnytn	1620
wsntgyatgg	cngaytaygg	ngcncngtn	tttyccnttyy	tngcnathgg	nggntayaar	1680
ggnaargayt	aywsngargc	ngargcnytn	athatgacnt	tywsnytnaa	yaaytayccn	1740
gcngggngayc	cnmgnytn	ncargcnaar	ytntgggarg	argcnttyyt	ngargaratg	1800
mgngcnttyc	armgnmgnat	ggcnggnatg	ttycargtna	cnttyacngc	ngarmgnwsn	1860
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gtngtnccnt	tyytngtnyt	nwsngtnngn	gcngayaaya	thhttyathtt	ygtnytngar	2160
taycarmgny	tnccnmgnmg	nccnggngar	ccnmngngarg	tncayathgg	nmngncnytn	2220
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ggngcnytna	cncnatgcc	ngcngtnmgn	acnttygcny	tnacnwsngg	nytnngcngtn	2340
athytnngayt	tyytnytnca	ratgwsngcn	tttygtngcny	tnytnwsnyt	ngaywsnaar	2400
mgncargarg	cnwsnmgnyt	ngaygtntgy	tgytgygtna	arccncarga	rytnccncn	2460
ccnggncarg	gngarggnyt	nytnytnngn	tttyttycara	argcntaygc	nccnttyytn	2520
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wsntayytny	tngaytaytt	yytnnttyytn	aaymgntayt	tygargtngg	ngcncngtn	2700
taytttygtna	cnacnytnng	ntayaaytty	wsnwsngarg	cnggnatgaa	ygcnathtg	2760
wsnwsngcng	gntgyaayaa	ytytwsntty	acncaraara	thcartaygc	nacngartty	2820
ccngarcarw	sntayytngc	nathccngcn	wsnwsntggg	tngaygaytt	yathgaytgg	2880

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ccnwsnacng	tnaaywsnyt	naaytgyytn	aaraaytgya	tgwsnathac	natgggnwsn	3000
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aayathaart	gyccnaargg	nggnytnngn	gcntaywsna	cnwsngtnaa	yytnacnwsn	3120
gayggncarg	tnytngcnws	nmgnttyatg	gcntaycaya	arccnytnaa	raaywsncar	3180
gaytayacng	argcnytnmg	ngcngcnmgn	garytngcng	cnaayathac	ngcngayytn	3240
mgnaargtnc	cnggnacnga	yccngcntty	gargtnnttyc	cntayacnat	hacnaaygtn	3300
ttytaygarc	artayytnac	nathytnccn	garggnytn	tyatgytnws	nytnngyytn	3360
gtncnccn	tygcnngtnws	ntgyytnytn	ytnggnytn	ayytnmgtnws	nggnytnytn	3420
aayytnytnw	snathgtnat	gathytnngtn	gayacngtn	gnttyatggc	nytnngggay	3480
athwsntaya	aygcnngtnws	nytnnathaa	ytngtnwsng	cngtnngnat	gwsngtngar	3540
ttygtnwsnc	ayathacnm	nwsnttygcn	athwsnacna	arccnccntg	gytnngarmgn	3600
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mgnytnaayy	tnytnathac	nytnytnngn	ytnytnccayg	gnytnngtn	yytnccngtn	3780
athytnwsnt	aygtnngncc	ngaygttnaay	ccngcnnytn	cnytnngarca	raarmngcn	3840
gargargcng	tnngcnngtn	natggtnngn	wsntgyccna	aycayccnws	nmgngtnwsn	3900
acngcnngaya	ayathtaygt	naaycaywsn	ttygarggnw	snathaargg	ngcngngcn	3960
athwsnaayt	tyytnccnaa	yaayggngmgn	cartty			3996